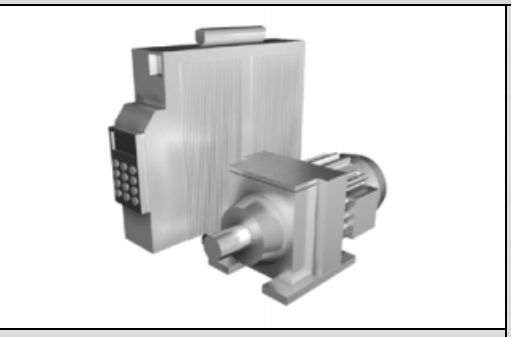

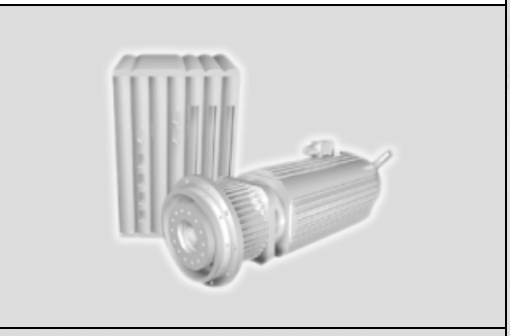

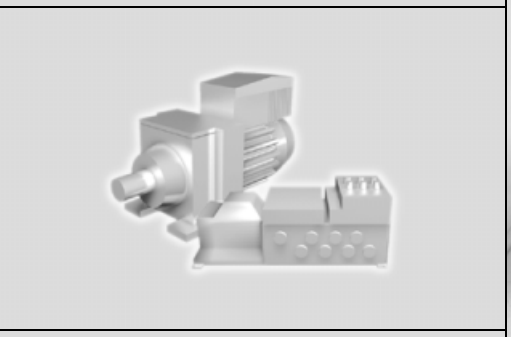

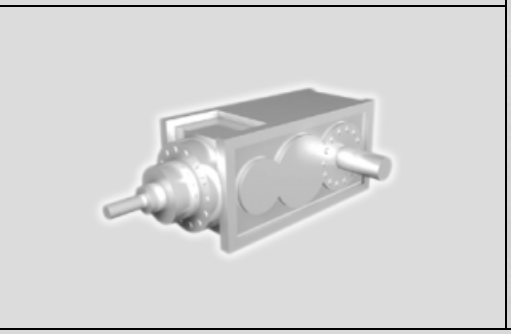

Explosion-Proof VARIBLOC® Variable Speed Gear Units and Accessories

Edition 11/2006
11528613 / EN

Operating Instructions

SEW EURODRIVE

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1 Important Information about the Operating Instructions

Introduction

You must adhere to the information in the operating instructions to ensure fault-free operation and for the fulfillment of any rights to claim under the limited warranty. Read the operating instructions before you start working with the unit.

Make sure that the operating instructions are available to persons responsible for the system and its operation, as well as to persons who work independently on the unit.

Also observe other technical documents, contracts for delivery or other agreements.

Designated use

The VARIBLOC® variable speed gear units are intended for commercial and industrial systems and may only be used in accordance with the information provided in SEW-EURODRIVE's technical documentation and the information given on the nameplate. It corresponds to valid standards and regulations and meet the requirements of EC Directive 94/9/EC and the EC Directive for Machinery 98/37/EC.

Gear unit loads other than those specified and areas of application other than industrial and commercial systems can only be used after consultation with SEW-EURODRIVE.

Any application other than those mentioned is considered non-designated use.

A drive motor connected to the VARIBLOC® may not be operated on the frequency inverter.

Qualified personnel

VARIBLOC® variable speed gear units represent a potential hazard for persons and material. Consequently, assembly, installation, startup and service work may only be performed by trained personnel who are aware of the potential hazards.

Personnel must possess the required qualifications for the relevant task and be familiar with the:

- Assembly
- Installation
- Startup
- Operation
- Maintenance
- Servicing

of the product.

Personnel must carefully read the operating instructions, in particular the safety notes section, and understand and comply with them.

Exclusion of liability

You must comply with the information contained in these operating instructions to ensure safe operation of the VARIBLOC® variable speed gear unit and to achieve the specified product characteristics and performance requirements.

SEW-EURODRIVE GmbH & Co KG assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

Product names and trademarks

The brands and product names contained within these operating instructions are trademarks or registered trademarks of the titleholders.

Disposal

(Please follow the current instructions):

- Housing parts, gears, shafts and anti-friction bearings of the gear unit must be disposed of as steel scrap. This also applies to gray-cast iron parts if there is no special collection.
- Collect waste oil and dispose of it according to the regulations in force.

1.1 Explanation of symbols

The important information contained in the operating instructions that deal with general and operational safety is emphasized in particular with the following symbols.

Electrical hazard
Possible consequences: Severe or fatal injuries.

Hazard
Possible consequences: Severe or fatal injuries.

Hazardous situation
Possible consequences: Slight or minor injuries.

Harmful situation
Possible consequences: Damage to the drive and the environment.

Tips and useful information.

Important information about explosion protection.

2 Safety Notes

2.1 Safety notes for using VARIBLOC®

The following safety notes apply to variable speed gear units.

When using **variable speed gearmotors**, also refer to the safety notes for gear units and motors in the relevant operating instructions. **Take into consideration the supplementary safety notes in the individual sections of these operating instructions.**

Explosive gas mixtures or dust concentrations when combined with hot, live, and moving parts of electrical machinery can cause serious injury or death.

Only qualified personnel may perform assembly, connection, startup, maintenance, and repair work on the VARIBLOC® variable speed gear unit while taking the following into account:

- These operating instructions
- The warning and instruction labels on the variable speed gear unit/variable speed gearmotor
- All other project planning documentation, startup instructions and wiring diagrams
- The specific regulations and requirements for the system
- The current national/regional regulations in effect

Optional equipment

Optional equipment complies with existing standards and regulations:

- EN50014
- EN50018 for protection type "d"
- EN50019 for protection type "e"
- EN50020 intrinsically safe "i"
- EN 50281-1-1/EN 50281-1-2 "Electrical apparatus for use in the presence of combustible dust"

In addition to general installation guidelines, the following regulations in accordance with ElexV 1 (or other national regulations) must be observed for electrically operated options:

- EN 60 079-14 "Electrical apparatus for explosive gas atmospheres"
- EN 50281-1-2 "Electrical apparatus for use in the presence of combustible dust"
- DIN VDE 105-9 "Operating electrical equipment" or other national regulations
- DIN VDE 0100 "Erection of power installations with rated voltages below 1000 V" or other national regulations
- System-specific regulations

Technical data and information on approved conditions on site can be found on the nameplate and in this manual.

You must comply with this information.

3 VARIBLOC® in Explosion-Proof Version

3.1 Unit design

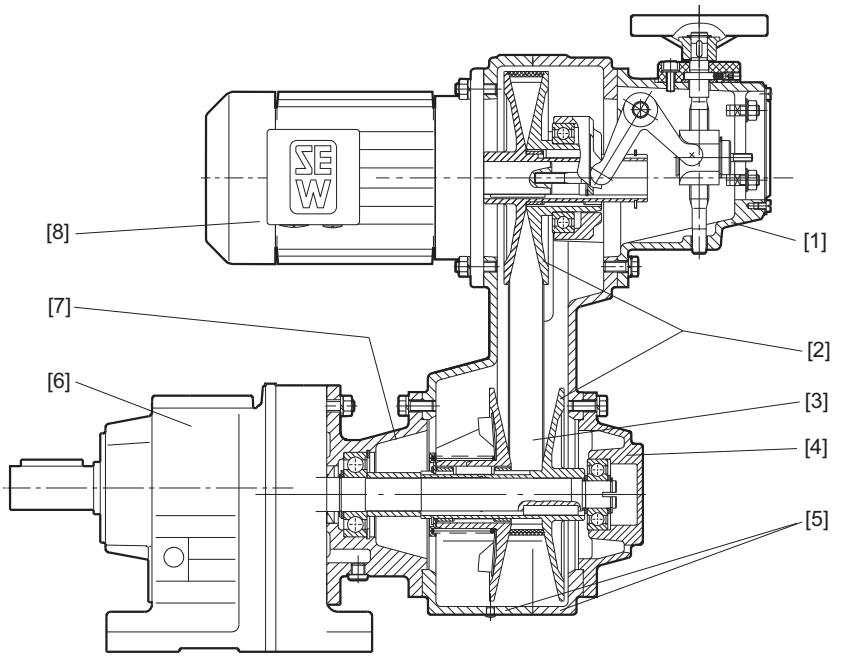
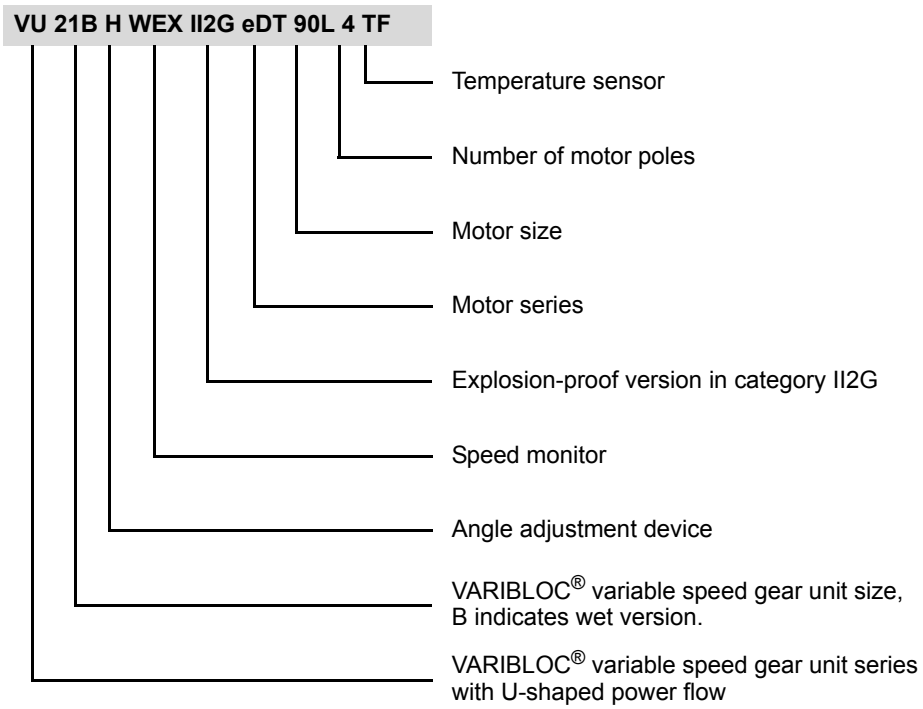


Fig. 1: VARIBLOC® in explosion-proof version

[1] Angle adjustment device
[2] Adjustment discs
[3] Wide V-belt
[4] Bearing cover with M12X1 tapped hole
[5] Two-part variable speed gear unit housing
[6] Coupled reduction gear unit
[7] Output flange
[8] Driving motor

3.2 Unit designation

The following diagram shows the type code structure:


VU 21B H WEX II2G eDT 90L 4 TF
Temperature sensor
Number of motor poles
Motor size
Motor series
Explosion-proof version in category II2G
Speed monitor
Angle adjustment device
VARIBLOC® variable speed gear unit size,
B indicates wet version.
VARIBLOC® variable speed gear unit series
with U-shaped power flow

3.3 Nameplate

Example

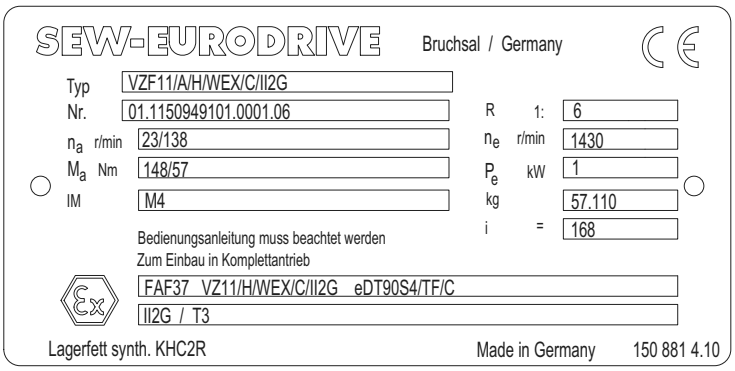


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Fig. 2: Nameplate

Type	Type code
Nr.	Sales order number
n_a	Minimum and maximum output speed
M_a	Output torque at minimum and maximum output speed
IM	Mounting position
R	Control range
n_e	Input speed
P_e	Input power
kg	Weight
i	Gear ratio

3.4 Mounting options

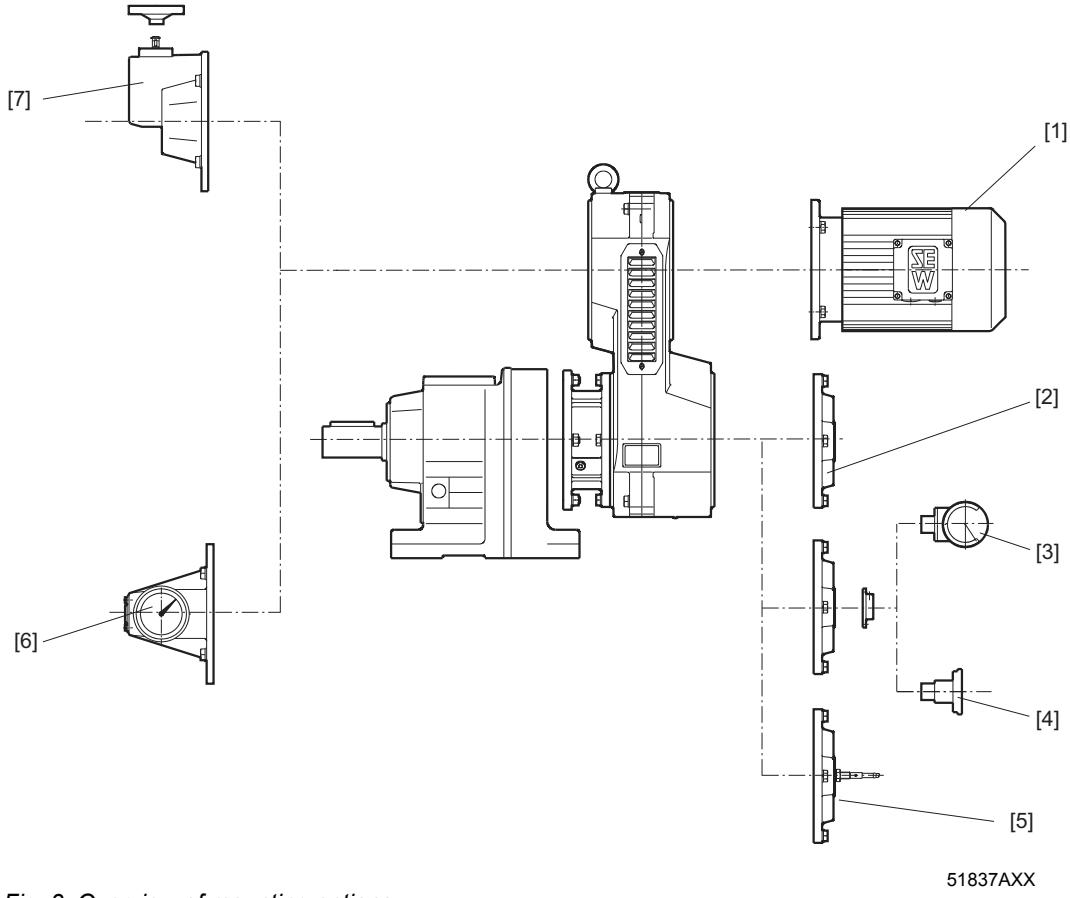


Fig. 3: Overview of mounting options

[1] Driving motor
[2] Bearing cover with M12x1 tapped hole (standard equipment)
[3] Right-angled tachometer TW
[4] Axial tachometer TA
[5] Voltage encoder IGEX
[6] Adjustment device with handwheel and position indication HS
[7] Adjustment device with handwheel H (standard version)/with free shaft end NV

4 Installation

Strictly observe the safety notes on page 8 when installing the variable speed gear unit.

Never adjust variable speed gear units at standstill (as you may damage the adjustment device and the wide V-belt).

4.1 VARIBLOC® in categories 2G and 2D

General information

- SEW explosion-proof variable speed gear units of the **VARIBLOC® 01-41** series meet the design specifications of equipment group II, categories 2G (explosive gas atmosphere) **and 2D** (explosive dust atmosphere). These units are intended for use in **zones 1 and 21**.
- SEW explosion-proof variable speed gear units of the **VARIBLOC® 51** series meet the **design** requirements of equipment group II, **category 2G** (explosive gas atmosphere). These units are intended for use in **zone 1**.
- Standard feature of SEW explosion-proof variable speed gear units of the VARIBLOC® 01-51 series is a M12x1 tapped hole for installation of a voltage encoder.

Protection class

- Only VARIBLOC® variable speed gear units as enclosed versions may be used in category 2D. This version meets protection class IP6X according to EN60529.

Designation "X"

- If the designation "X" appears after the certification number on the declaration of conformity or the EC prototype test certificate, this indicates the certificate contains special conditions for safe application of the variable gear unit.

Temperature class

- VARIBLOC® variable speed gear units, category 2G (explosive gas atmosphere) are approved for temperature class T3. The temperature class of the variable speed gear unit is indicated on the nameplate.

Surface temperature

- The maximum surface temperature of VARIBLOC® variable speed gear units, category 2G (explosive dust atmosphere) may not exceed 200 °C. The system operator must guarantee that a possible accumulation of dust will not exceed a maximum thickness of 5 mm in accordance with EN50281-1-2.

Ambient temperature

- VARIBLOC® variable speed gear units in categories 2G and 2D may only be used at an ambient temperature of –20 °C to +40 °C.

Output power and output torque

- It is essential that nominal values of output power and/or output torque are maintained.
- VARIBLOC® variable speed gear units of categories 2G and 2D may only be started up with functional speed monitoring. The speed monitor must be correctly mounted and set (see Sec. "Startup").

Verify the speed monitoring function before startup.

4.2 VARIBLOC® in categories 3G and 3D

General information

- SEW explosion-proof variable speed gear units of the VARIBLOC® 01-51 series meet the design specifications of equipment group II, categories 3G (explosive gas atmosphere) and 3D (explosive dust atmosphere). These units are intended for use in zones 2 and 22.
- Standard feature of SEW explosion-proof variable speed gear units of the VARIBLOC® 01-51 series is a M12x1 tapped hole for installation of a voltage encoder.

Temperature class

- VARIBLOC® variable speed gear units in category 3G (explosive gas atmosphere) are approved for temperature class T4. The temperature class of the variable speed gear unit is indicated on the nameplate.

Surface temperature

- The maximum surface temperature of VARIBLOC® variable speed gear units, category 3D (explosive dust atmosphere) may not exceed 135 °C. The system operator must guarantee that a possible accumulation of dust will not exceed a maximum thickness of 5 mm in accordance with EN50281-1-2.

Ambient temperature

- VARIBLOC® variable speed gear units in categories 3G and 3D may only be used at an ambient temperature of –20 °C to +40 °C.

Output power and output torque

- It is essential that nominal values of output power and/or output torque are maintained. The unit operator must ensure that the output shaft of the variable speed gear unit is not overloaded or blocked.

If an overload condition of the VARIBLOC® as category 3G or 3D unit cannot be ruled out during normal operation, a VARIBLOC® unit with a functioning speed monitor must be used (see Sec. "Speed monitoring").

4.3 Before you begin

The drive may only be installed if

- You are certain that the following requirements have been met:
  - Ambient temperature between –20 °C and +40 °C
  - There are no potentially explosive atmospheres, oils, acids, gases, vapors, radiation, etc. during installation.
- The protection type IP5X according to EN60529 for VARIBLOC® of category 2D has been verified.
- The information on the nameplate of the drive matches the approved on-site explosion application range (equipment group, category, zone, temperature class or maximum surface temperature).
- The information on the nameplate of the drive matches the voltage supply system.
- The drive is undamaged (no damage caused by transportation or storage).

4.4 Preliminary work following lengthy storage

Variable speed gear unit

Risk of material damage

Do not let the solvent come into contact with the sealing lips of the oil seals or on the wide V-belt.

The output shafts and flange surfaces must be thoroughly cleaned of anti-corrosion agents, contamination or such (use a commercially available solvent).

Please note:

- The service life of the lubricant in the bearings is reduced if the unit is stored for ≥ 1 year.
- The enclosed wide V-belt must be installed.

Anti-friction bearing greases

	Ambient temperature	Base	Original filling	Brand
Gear unit anti-friction bearing	–20 °C to +40 °C	synthetic	Mobiltemp SHC 100	Mobil

4.5 Installation

The variable speed gear unit or variable speed gearmotor may only be installed/ mounted in the specified mounting position on a level[1)], vibration damping and torsionally rigid support structure. Do not tighten housing legs and mounting flanges against each other.

VARIBLOC® version HS (handwheel with position indication) must be mounted so that the adjusting spindle is horizontal; otherwise the position indication will not function properly.

The breather valves must be easily accessible. The plastic plug of the condensation drain hole in variable speed gear units of categories 2G, 3G and 3D at the lowest position must be removed before operation (risk of corrosion).

The plastic plug of the condensation drain hole at the lowest position with category 2D variable speed gear units may not be removed.

- Carefully align the variable speed gear drives to avoid overloading the output shafts (observe permissible overhung loads and axial forces).
- Do not butt or hammer the shaft end.
- **Use an appropriate cover to protect motors in vertical mounting positions from objects or fluids entering (protection canopy C). Cover the vent plate on top of the control box in level position (determined by the mounting position) with the cover plate included in the delivery.**
- Ensure an unobstructed cooling air supply and that air heated by other apparatus cannot be drawn in and reused. The cooling air may not exceed a temperature of 40 °C.

1) Maximum permitted flatness error for flange mounting (approximate values with reference to DIN ISO 1101): with → flange 120 ... 600 mm max. error 0.2 ... 0.5 mm

Installation in damp locations or outdoors

- VARIBLOC® gear units are available in corrosion-resistant versions (version B) for use in damp locations or outdoors. Any damage to the coating (e.g. on the breather valve) must be repaired.

Cable entry, cable gland

- All **cable entries** are provided with ATEX certified plugs.
- To establish the **correct cable entry**, the plugs are replaced by **ATEX certified cable glands with strain relief**.
- Select the cable gland according to the outer diameter of the cable used.
- All **non-required cable entries must be sealed** with an ATEX certified plug after installation is completed.
- Coat the threads of cable glands and filler plugs with sealing compound and tighten them well – then coat them again. Properly seal the cable entry.
- Properly clean the sealing surfaces of the terminal box and terminal box cover before reassembly. Replace brittle gaskets.

Painting the gear unit

If all or some of the surfaces of the drive are to be painted, make sure that you carefully mask over the breather valve and the oil seals. Remove the strips of tape after completing the painting work.

Required tools/resources

- Set of wrenches
- Mounting device
- Compensation elements (shims, spacing rings) if necessary
- Mounting materials for output components

Installation tolerances

Diameter tolerance in accordance with DIN 748 • ISO k6 for solid shafts with d, d1 ≤ 50 mm • ISO k7 for solid shafts with d, d1 > 50 mm • Center hole in accordance with DIN 332, shape DR.	Centering shoulder tolerance in accordance with DIN 42948 • ISO j6 at b1 ≤ 230 mm • ISO h6 with b1 > 230 mm

4.6 Permissible overhung loads without primary gear unit

The VARIBLOC® explosion-proof variable speed gear unit can also be operated without a primary gear unit. The permitted lateral forces on the output shaft are shown in the following diagrams in relation to speed.

Definition of lateral force application point

The behavior of the lateral force depicted in the diagrams below refers to force applied to the center of the shaft end. If force is applied to areas other than the center of the shaft end, consult SEW-EURODRIVE for permitted lateral forces.

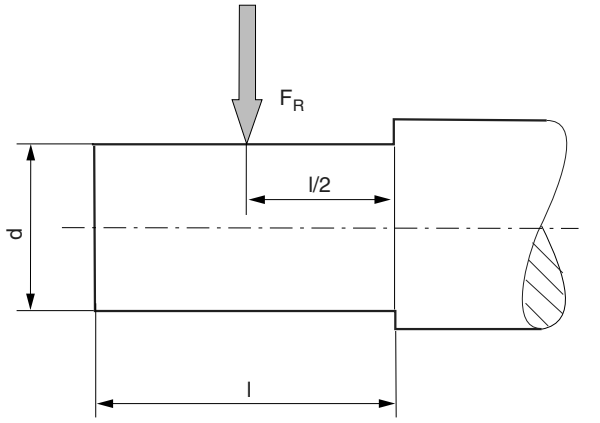
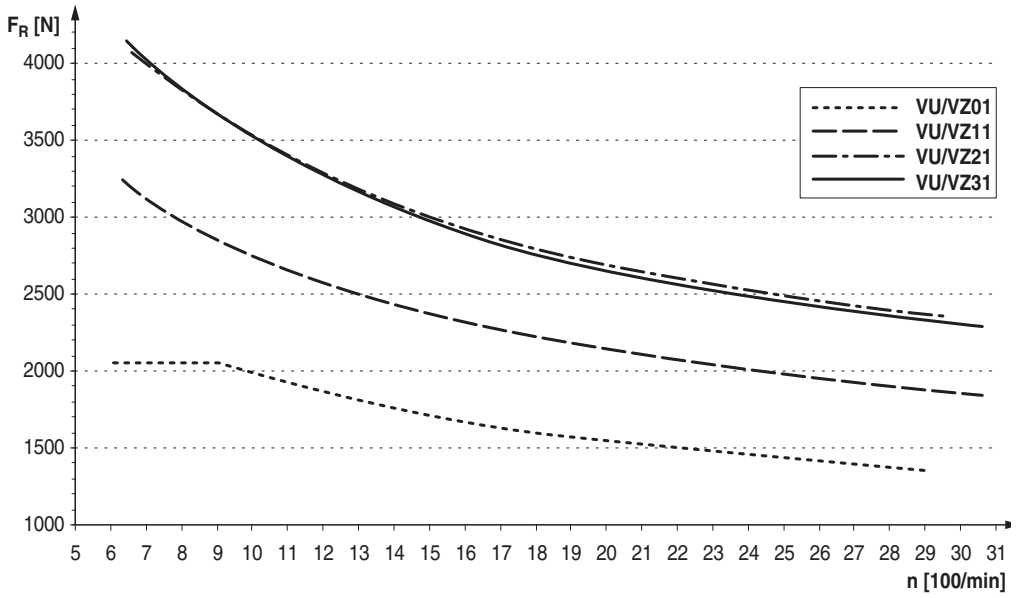


Fig. 4: Definition of lateral force application point

F_R = permissible lateral force application point to the center of the shaft end



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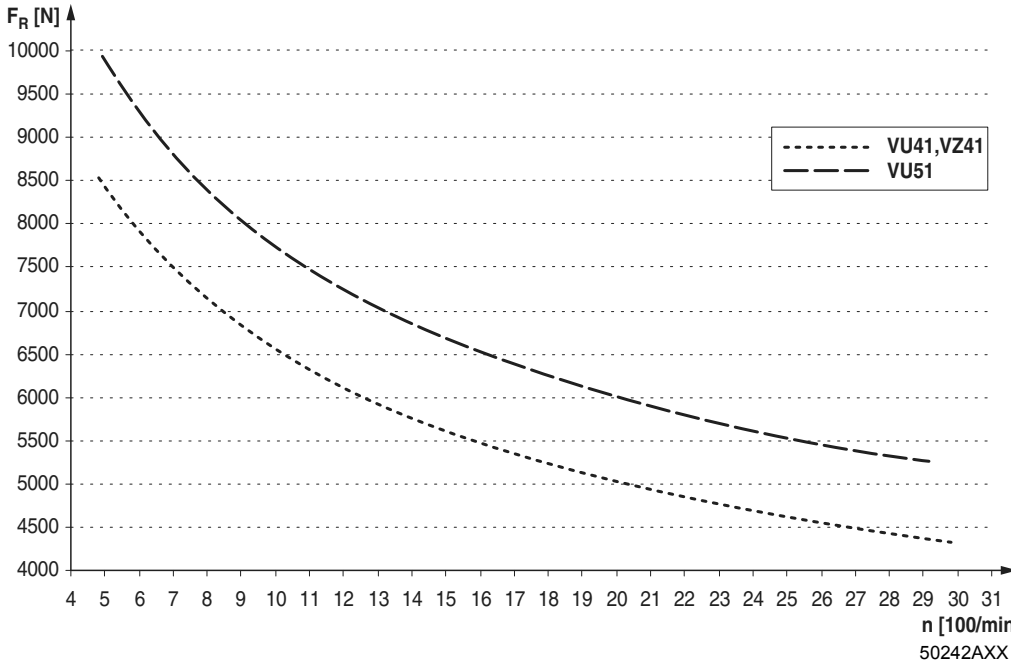

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4.7 Mounting output elements

The following figure shows an example of a mounting device for installing couplings or hubs on variable speed gear unit or motor shaft ends. It is possible that you do not need the thrust bearing on the mounting device.

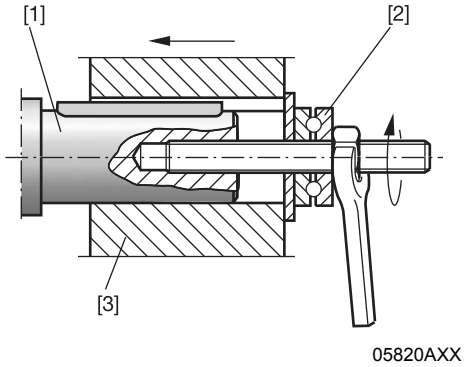

Fig. 5: Example of a mounting device

[1] Gear shaft end
[2] Thrust bearing
[3] Coupling hub

The following illustration shows the correct mounting arrangement (**B**) of a gear wheel or chain sprocket for avoiding impermissibly high lateral forces.

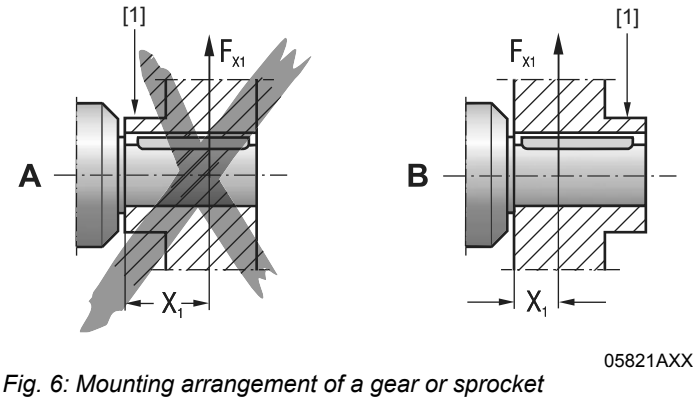

Fig. 6: Mounting arrangement of a gear or sprocket

[A] Incorrect
[B] Correct
[1] Hub

- Do not install input and output elements without a mounting device (see Fig. 03371BXX). Use the center bore with the thread on the shaft end for positioning.
- Never drive belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer (this will cause damage to bearings, housing and the shaft).
- With belt pulleys, ensure the belt is correctly tensioned according to manufacturer's specifications.
- Power transmission elements should be balanced after installation and must not give rise to impermissible radial or axial forces (see 05821AXX/for approved values, see the catalog for "Gearmotors").

Assembly is easier if you first apply lubricant to the output element or heat it up briefly (to 80 °C – 100 °C).

Mounting couplings

Couplings must be mounted and balanced according to the information provided by the coupling manufacturer:

a) Maximum and minimum clearance

b) Axial offset

c) Angular offset

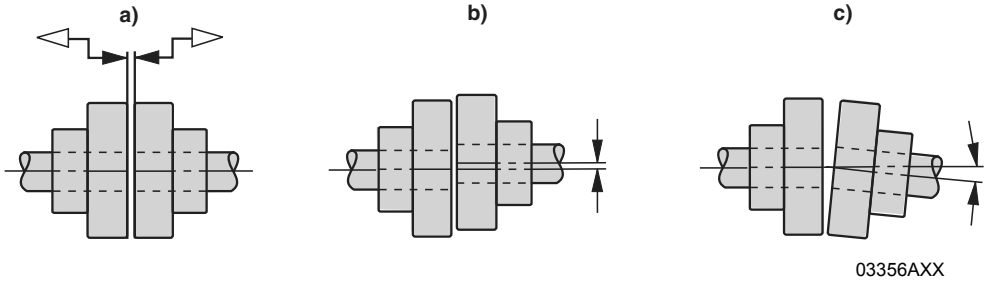

Fig. 7: Clearance and misalignment for coupling mounting

Input and output elements such as belt pulleys, couplings, etc. must have protection against contact.

5 Startup

5.1 Speed monitoring

Category 2G or 2D variable speed gear units may only be started up with speed monitoring.

Standard version

The standard version of the VARIBLOC® explosion-proof variable speed gear unit features an M12x1 thread for mounting a voltage encoder in the bearing cover of the variable speed gear unit. Speed monitor and voltage encoder must be supplied and installed by the operator of the device (see page 26 "Installation of the voltage encoder").

Additional versions:

The following additional versions of speed monitoring are possible:

1. WEXA:
   - Speed monitor (incl. evaluation electronics) with IGEX voltage encoder and digital remote speed indicator.
2. WEX:
   - Speed monitor (incl. evaluation electronics) with IGEX voltage encoder.
3. IGEX:
   - This version consists only of the IGEX voltage encoder in the scope of delivery. The speed monitor must be supplied and installed by the operator of the device.

Manufacturer's data

Speed monitor in WEXA/WEX version:

Manufacturer:	Pepperl + Fuchs, Mannheim
Type:	KFU8-UFC-Ex1.D
Auxiliary power:	DC 20 - 90 V / AC 48 - 253 V
ATEX certification number:	TÜV 99 ATEX 1471

Voltage encoder in WEXA/WEX/IGEX version:

Manufacturer:	Pepperl + Fuchs, Mannheim
Type:	NCB2-12GM35-N0 in accordance with DIN 19234 (NAMUR)
Housing:	M12x1
ATEX certification number:	TÜV 99 ATEX 1471

5.2 Installation and adjustment of the WEXA/WEX speed monitor

The speed monitor must be located outside the potentially explosive atmosphere.

All installation and setting notes given below refer to the speed monitor or voltage encoder in WEXA/WEX version.

If other speed monitors in WEXA/WEX version are used, they must be installed and started up according to the manufacturer's documentation. The section "Installation and adjustment of other speed monitors" (see the following page) contains information on determining the switching speed or switching frequency for this particular case.

1. Read the operating instructions of the speed monitor manufacturer before you begin with the installation.
2. Perform the basic adjustment of the speed monitor in accordance with the operating instructions of the speed monitor manufacturer (see table "VARIBLOC® switching frequency" on page 24).

   Setting must be carried out in a way that the drive switches off when the frequency or speed drops below the limit values specified in the above table. The sensor built in the variable speed gear unit generates two pulses per revolution of the variable speed gear shaft.

   If the switching speed of the variable speed gear unit is not met, the drive motor must be immediately disconnected from its supply voltage.

   The cause of the problem must be eliminated and the operation of the variable speed gear unit stopped for at least 15 minutes before restarting the variable speed gear unit. If incorrect operation by the operating personnel cannot be ruled out, this interval should be triggered by an automatic restart lockout.

   If vibrations or increased operating noises are noticeable after restarting the variable speed gear unit, the wide V-belt was damaged during the blocking and must be replaced (see Sec. "Inspection/maintenance" Replacing wide V-belt).

Relay 2 can be used for creating a warning signal or for machine control (terminal assignment 16-18).

The wiring diagram below shows possible wiring of the speed monitor.

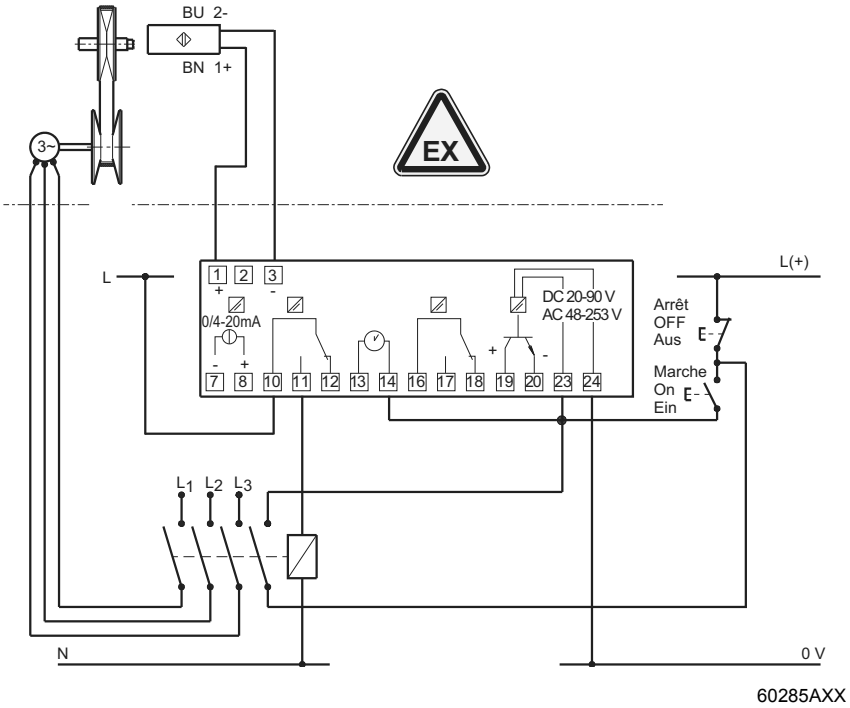

Fig. 8: Connecting the WEXA/WEX speed monitor

[1]	Sensor +	[14]	Startup bypass
[3]	Sensor -	[23]	DC 24 V voltage supply, +
[10]	Relay 1 (common wiring)	[24]	DC 24 V voltage supply, -
[11]	Relay 1 (normally open contact)	[19]	Auxiliary output for customer application, +
[12]	Relay 1 (normally closed contact)	[20]	Auxiliary output for customer application, -

Front side of the speed monitor

The start bypass time may not exceed 5 seconds. This setting must be carefully performed and verified by a final measuring step.

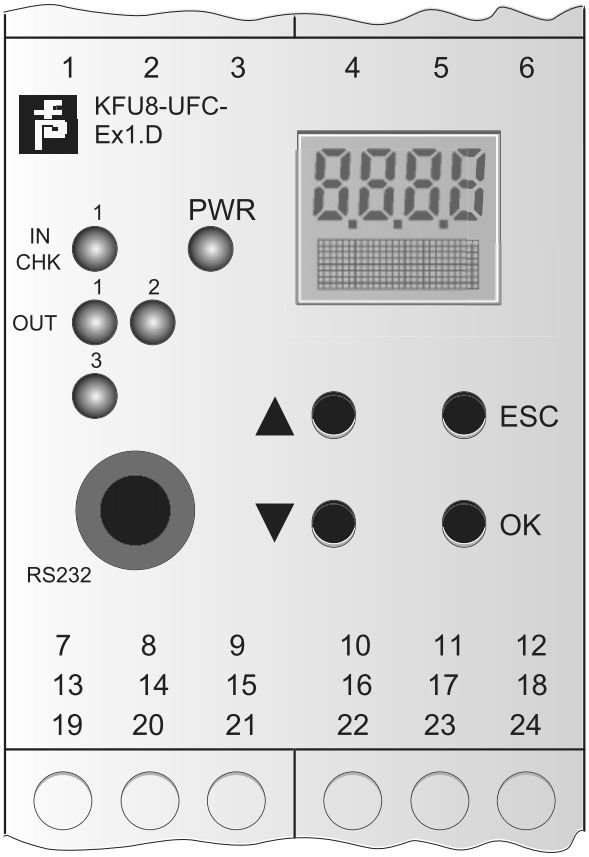

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Fig. 9: WEXA/WEX version speed monitor

Front side of the speed monitor:

LED in CHK 1 (yellow/red)	For indicating the input pulses (flashes yellow), the input interference (flashes red), and unit malfunction (continuously lit red)
LED PWR (green)	For indicating the supply voltage
LED OUT 1 (yellow)	For indicating relay 1 is active.
LED OUT 2 (yellow)	For indicating relay 2 is active.
LED OUT 3 (yellow)	For indicating the transistor is active.
RS 232	The RS 232 interface used for connecting a PC for parameter setting and diagnosing the UFC with PACTware.
Display	For indicating measured values and faults in parameter assignment mode

VARIBLOC® switching frequency

Type	Motor frequency [Hz]	Motor pole number	IGEX switching frequency [Hz]	Output speed of the variable speed gear unit [1/min]
VU/VUF01 VZ/VZF01	50	4	18	535
	50	6	12	356
	50	8	9	267
	60	4	22	635
	60	6	14	416
	60	8	11	327
VU/VUF11 VZ/VZF11	50	4	15	446
	50	6	10	297
	50	8	8	238
	60	4	19	564
	60	6	13	386
	60	8	9	267
VU/VUF21 VZ/VZF21	50	4	15	446
	50	6	10	297
	50	8	7	208
	60	4	18	535
	60	6	12	356
	60	8	9	267
VU/VUF31 VZ/VZF31	50	4	15	446
	50	6	10	297
	50	8	7	208
	60	4	18	535
	60	6	12	356
	60	8	9	267
VU/VUF41 VZ/VZF41	50	4	15	446
	50	6	10	297
	50	8	7	208
	60	4	18	535
	60	6	12	356
	60	8	9	267
VU51	50	4	15	446
	50	6	10	297
	50	8	7	208
	60	4	18	535
	60	6	12	356
	60	8	9	267

Installation and adjustment of other speed monitors

If other speed monitors are used, they must feature an intrinsically safe sensor input (identification color: blue) for evaluating sensors in accordance with DIN 19234 (NAMUR) and be approved for use of this sensor in potentially explosive atmospheres.

The voltage encoder (sensor) generally features a blue connection lead and must conform to DIN 19234 (NAMUR). The corresponding inspection number may be attached to the voltage encoder or the connection cable.

If the switching speed of the variable speed gear unit is not met, the drive motor must be immediately disconnected from its supply voltage.

The cause of the problem must be eliminated and the operation of the variable speed gear unit stopped for at least 15 minutes before restarting the variable speed gear unit. If incorrect operation by the operating personnel cannot be ruled out, this interval should be triggered by an automatic restart lockout.

If vibrations or increased operating noises are noticeable after restarting the variable speed gear unit, the wide V-belt was damaged during the blocking and must be replaced (see Sec. "Inspection/maintenance" Replacing wide V-belt).

5.3 Installation of the voltage encoder

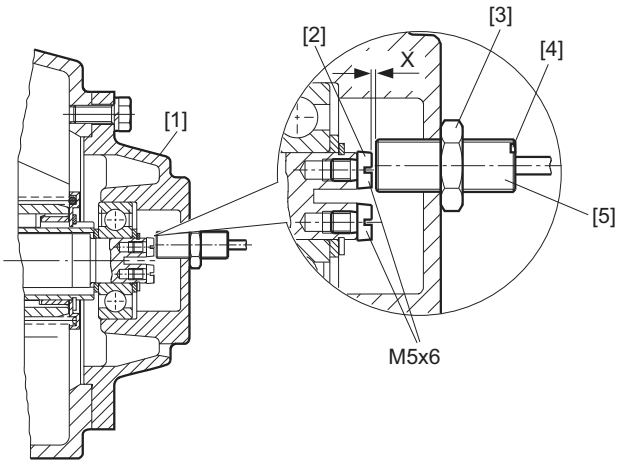

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Fig. 10: Installation of voltage encoder and adjusting the switching interval x

[1] Bearing cover
[2] Screw head
[3] Lock nut
[4] LED
[5] Voltage encoder

1. Rotate the output shaft of the variable speed gear unit until the slotted screw head can be seen through the tapped hole in the bearing cover.
2. Voltage encoder:
   - Carefully screw it into the bearing cover [1] of the variable speed gear unit until the voltage encoder [5] rests on the screw head [2].
   - Turn the encoder back by one turn and secure with lock nut [3].

The switching interval x is now set to one 1 mm. When in operation, the voltage encoder supplies two pulses per revolution during this switching interval.

Changing switching interval x

If no circuit state change occurs at the voltage encoder (LED display) with rotating shaft of the variable speed gear unit operating with switching interval x = 1 mm, the switching interval can be changed as follows:

1. When the voltage encoder **LED** [4] **is constantly lit**, turn the voltage encoder a half turn **counterclockwise** at a time and check its function.
2. When the **LED** [4] **is not lit**, turn the voltage encoder **clockwise** by 90 degrees but no more than one time.

Do not turn the voltage encoder more than half a turn into the tapped hole because it would be destroyed by a collision with the slotted screw heads.

3. If a circuit state change still does not occur, check the voltage supply of the voltage encoder using the evaluation electronics (with WEXA/WEX version).

5.4 Mounting right-angled tachometer TW, axial tachometer TA

The TW and TA tachometers may only be mounted on category 3D/3G variable speed gear units if a voltage encoder (WEXA/WEX, IGEX version) is not necessary.

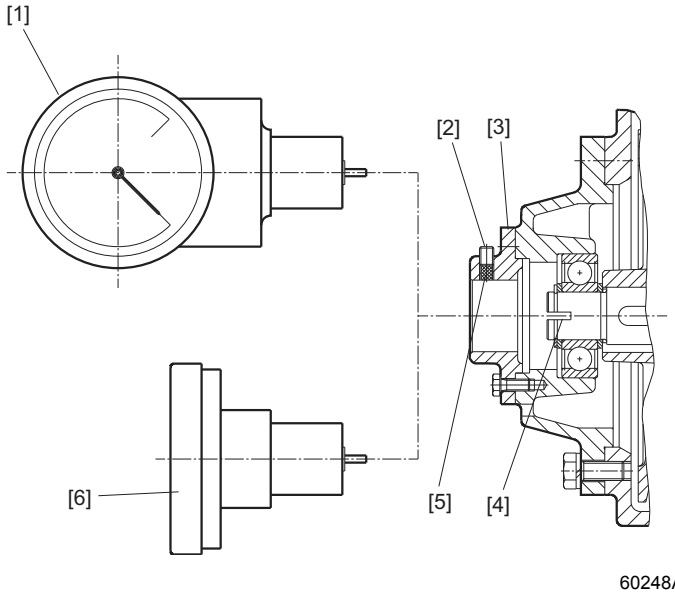

Fig. 11: Mounting right-angled tachometer TW, axial tachometer TA

[1]	Right-angled tachometer TW	[4]	Shaft groove
[2]	Setscrew	[5]	Friction pad
[3]	Tacho flange	[6]	Axial tachometer TA

1. Install right-angled tachometer TW [1] or axial tachometer TA [6] in tacho flange [3]:
   - Tongue must engage in shaft groove [4]
2. Insert friction pad [5]
3. Secure TW or TA tachometer with setscrew [2]

5.5 Digital remote speed indicator

Observe the applicable wiring regulations for potentially explosive areas during the electrical installation of optional equipment.

The digital remote speed indicator, which is included in the scope of delivery with the WEXA version, is connected to the pulse output of the speed monitor type KFU8-UFC-Ex1.D by Pepperl + Fuchs.

Technical data

Manufacturer:	Dr. Horn
Type:	HDA 4110-50
Display unit:	Digital
Mains connection:	115 or 230 V, 50-60 Hz
Power consumption:	About 4.2 VA
Encoder connection:	With two-core cable, shielded

Connection/ adjustment

1. Connect the unit according to the wiring diagram.

This wiring diagram applies only to digital indicator units type HDA 4110-50 by Dr. Horn in combination with speed monitors type KFU8-UFC-Ex1.D by Pepperl + Fuchs.

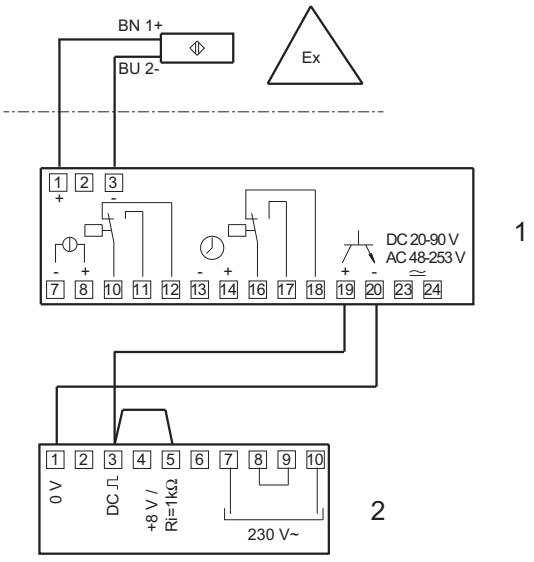

Fig. 12: Wiring diagram of digital remote speed indicator to speed monitor

[1] Speed monitor type KFU8-UFC-Ex1.D by Pepperl + Fuchs

[2] Digital remote speed indicator type HDA 4110-50 by Dr. Horn

2. Note the jumpers:
   - Between terminals 3 and 5
   - Between terminals 8 and 9 for AC 230 V auxiliary power

With auxiliary power of AC 115 V, the wiring of terminals 7, 8, 9, and 10 must be changed according to the manufacturer's documentation.

3. Adjust measuring interval (see the following figure and Sec. "Calculation examples for digital remote speed indicator" on page 31).
   - Calculation using a formula
   - Data according to table "Reference data of digital remote speed indicator" page 31
4. Adjust input sensitivity (see next page):
   - Turn "input sensitivity" potentiometer clockwise until the pulse indicator light lights up.

Setting the digital remote speed indicator

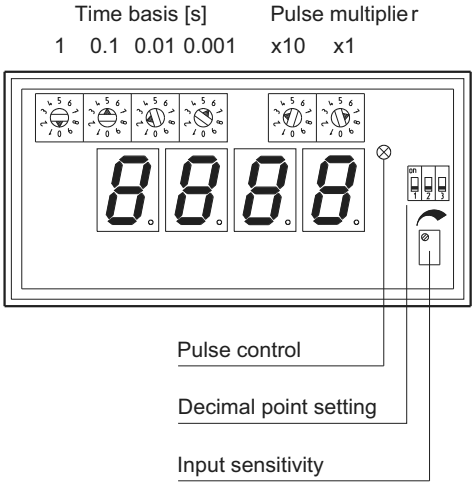

Fig. 13: Adjusting the digital remote speed indicator

- Indicating accuracy: +/-1 of last digit
- Measuring interval (quartz): adjustment in increments of 0.001 s in the range of 0.010 s to 9.999 s after removing the front panel, recommended measuring interval: 0.5 to 2 s
- Pulse multiplier: Setting in increments in the range of 1 to 99 after removing the front panel
- Decimal point setting: Via DIP switch after removing the front panel
- Calculation of measuring interval:

$$M = \frac{60 \cdot A}{n \cdot k \cdot z \cdot f}$$

M = Measuring interval
A = Four-digit display (at maximum speed), without decimal point indication
n = Speed (see following table)
k = Pulse multiplier 1
z = Pulses/revolution (see following table)
f = Calculation factor (at 50 Hz = 1, at 60 Hz = 1.2)

Reference data of digital remote speed indicator

VARIBLOC® type/size	Pulses/revolution	VARIBLOC® reference speed [rpm] R = 1:6/6:1		
		4-pole	6-pole	8-pole
VUF/VZF 01	2	3312	2088	1632
VUF/VZF 11		3250	2160	1615
VUF/VZF 21		3100	2050	1530
VUF/VZF 31		3100	2050	1540
VUF/VZF 41		3053	2035	1505
VUF/VZF 51		3106	2056	1526
VUF/VZF 01		3312	2088	1632

Calculation examples for digital remote speed indicator

	Example 1	**Example 2**
Drive	R107R77VU21WEXA/II2G eDT90L4	R107R77VU21WEXA/II2G eDT90L4
Data	Output speed na = 1.0 - 6.3 Pulses/revolution z = 2 Max. speed of variable speed gear unit n = 3100 rpm (see the table on page 31)	Output speed na = 1.0 - 6.3 Pulses/revolution z = 2 Max. speed of variable speed gear unit n = 3100 rpm
Desired indication	Output speed A = 1.000 – 6.300 rpm	Belt speed A = 0.114 - 0.72 m/min
$M = \frac{60 \cdot A}{n \cdot k \cdot z \cdot f}$	$M = \frac{60 \cdot 6300}{3100 \cdot 1 \cdot 2 \cdot 1} = 60.96$ s	$M = \frac{60 \cdot 0720}{3100 \cdot 1 \cdot 2 \cdot 1} = 6.968$ s
Recommended measuring interval	0.5 - 2 s (max. 9.999 s)	
Calculation with new pulse multiplier	k = 50 $M = \frac{60 \cdot 6300}{3100 \cdot 50 \cdot 2 \cdot 1} = 1.219$ s	K = 8 $M = \frac{60 \cdot 0720}{3100 \cdot 8 \cdot 2 \cdot 1} = 0.871$ s
Device setting	Measuring interval: [1] [2] [1] [9] Pulse multiplier: [5] [0] Decimal point setting: 1	Measuring interval: [0] [8] [7] [1] Pulse multiplier: [0] [8] Decimal point setting: 1

6 Inspection and Maintenance

Strict adherence to the inspection and maintenance intervals is absolutely necessary to ensure safe working conditions and explosion protection.

- **Strictly observe the safety notes in the individual sections.**
- **All maintenance work must be carefully performed by qualified personnel.**
- **Work on the gear unit only when the machine is not in use. Prevent the drive unit from unintentionally starting up (for example, by locking the keyswitch or removing the fuses from the power supply). Place an information sign by the on-switch to warn that the gear unit is being worked on.**
- **Use only genuine spare parts from the relevant valid spare parts list; otherwise, the explosion rating of the variable speed drive becomes void.**

6.1 Before you begin

Required tools/resources

- Set of wrenches
- Hammer
- Drift or punch drift
- Snap ring, mounting press

6.2 Inspection and maintenance intervals

Unit/component	Interval	What to do?	Details on page ...
VARIBLOC®	**As required**	Eliminate dust accumulation > 5 mm by cleaning	
VARIBLOC®	**Weekly**	Pass through speed range	
VARIBLOC®	Every **3000** operating hours, at least **every 6 months**	• Check wide V-belt • Clean ventilation openings • Check bearings; lubricate and clean if necessary. • Check oil seals and replace with original SEW spare parts in case of heavy wear (porous, brittle) • VARIBLOC® category 2D: Check seals of cover plates and replace with original SEW spare parts in case of heavy wear (porous, brittle) • Check running noise/temperature of anti-friction bearing Interior of the variable speed gear unit: • Check for dust accumulation • Remove existing dust deposits	See "Checking wide V-belt" (see next page). See "Measuring temperature of anti-friction bearing" page 37.
VARIBLOC®	Every **6000** operating hours	• Replace wide V-belt	See "Replacing wide V-belt" on page 34.

VARIBLOC®	Every **20,000** operational hours	• Replace bearings
		• Check adjustment spindle
		  • Clean and grease
		  • Replace adjustment spindle in case of wear
			• Contact customer service
			• See "Re-lubricating adjustment spindle" page 36.

6.3 Checking wide V-belt

If one or more of the following test questions are answered positively ("Yes"), the wide V-belt must be replaced (see "Replacing wide V-belt" on the following page).

Type of check	For VUF 01-51/VZF 01-41 check
Functional test	• Do you notice a loud noise? • Did the maximum attainable speed drop by more than 10% compared to the nameplate data? • Are there any speed fluctuations?
Visual inspection	Remove vent plates: • Is there a lot of abraded dust noticeable at the vent plates or in the entire housing? • Are the sides of the belt frayed? • Is the wide V-belt cracking between the ribs or already torn?

6.4 Replacing wide V-belt

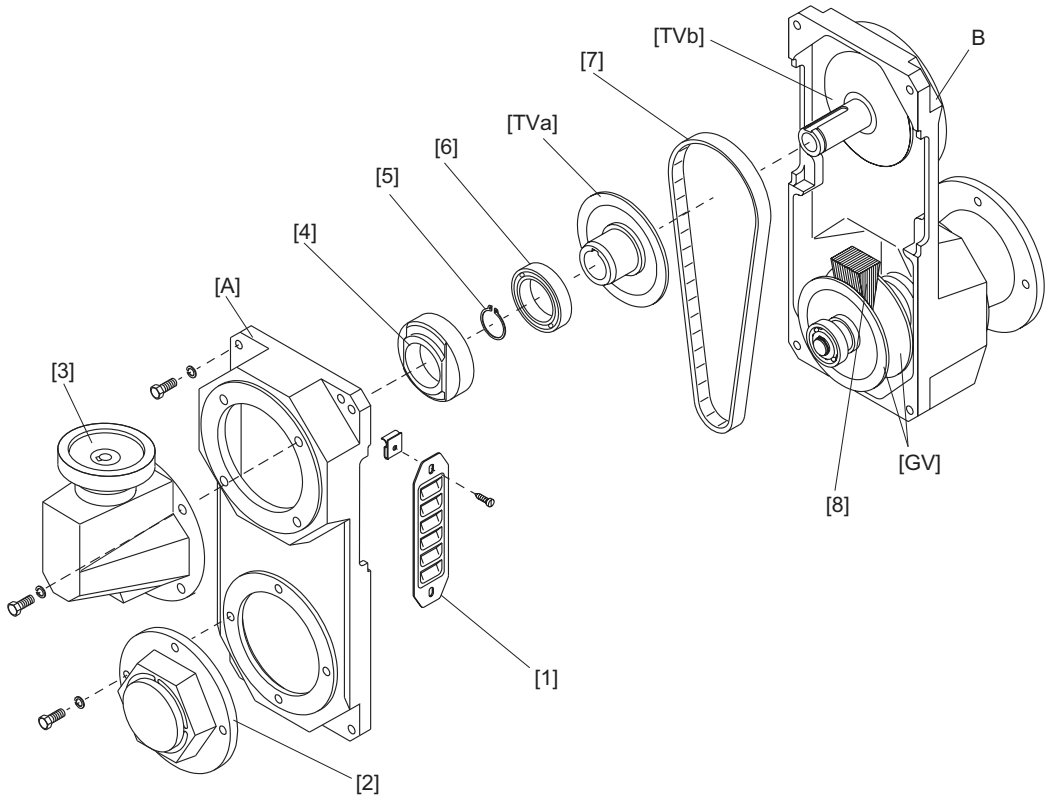

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Fig. 14: Replacing wide V-belt with VUF 01-51 and VZF 01-41

[1]	Vent plate	[6]	Ball bearing
[2]	Bearing cover	[7]	Wide V-belt
[3]	Angular adjustment unit	[8]	Wooden wedge
[4]	Adjusting ring	[TV]	Driving adjustment disc
[5]	Snap ring	[GV]	Driven adjustment disc
		[A] [B]	Control box halves

1. Set variable speed gearmotor to and arrest at highest speed
2. **Disconnect the variable speed drive from the power supply and prevent it from unintentionally re-starting. Block output side.**

3. Remove both lateral vent plates [1]
4. Remove bearing cover [2] and adjustment unit [3]
5. Loosen housing screws; separate control box halves [A] and [B].
6. Secure driven spring-opposed adjustment disc [GV] with wooden wedge [8].

Disc halves must not be allowed to snap together through spring load.

7. Remove:
   - Adjusting ring [4] (for front adjustment), snap ring [5], driving adjustment disc halves [TV_a]
8. Remove old wide V-belt [7] and insert new wide V-belt.
9. Install:
   - Driving adjustment half [TV_a], ball bearing [6], snap ring [5], adjusting ring [4]
10. Remove wooden wedge
11. Screw control box halves [A] and [B] together
12. Mount adjustment unit and bearing cover [2]
13. Attach vent plates [1]
14. Tighten wide V-belt
    - Turn positioning spindle clockwise using adjustment unit [3] until resistance is noticeable
15. Check torsional play at output shaft
    - Correct: Minor torsional play is noticeable
16. Remove blocking from output side (see point 2)
17. Switch on gearmotor
18. Slowly pass through the speed range
    - Correct: Drive runs smoothly and evenly

6.5 Re-lubricating H, HS, NV adjustment spindle

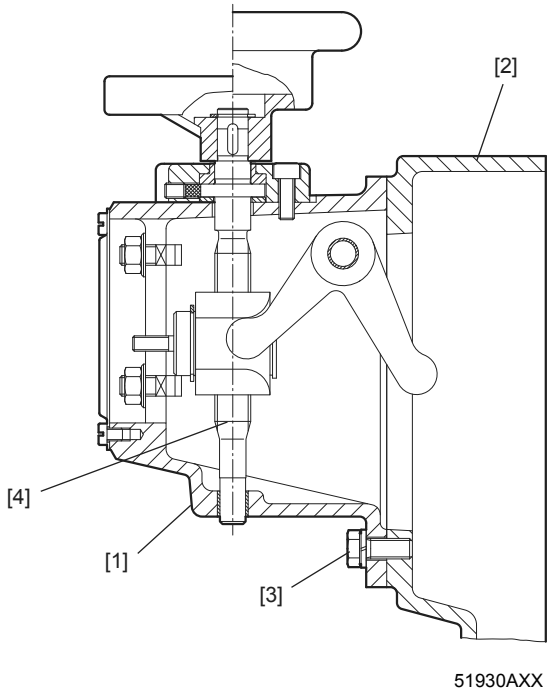

Fig. 15: Re-lubricating the adjustment spindle

[1]	Control head of control box	[3]	Screw
[2]	Control box	[4]	Adjustment spindle

1. Remove control head [1] from control box [2]
   - Loosen [3] screws
2. Lubricate adjustment spindle [4] with well-adhering lubricant, such as "Never Seeze normal"
3. Assemble in reverse order

6.6 Measuring the temperature of the anti-friction bearing

To ensure safe working conditions and explosion protection, it is necessary that the difference between the temperature of the anti-friction bearing and ambient temperature does not exceed the following values at the indicated test points:

If one of these values is exceeded, the affected anti-friction bearing must be replaced.

The temperature of the anti-friction bearing can be measured with commercially available thermometers. Select a thermometer of sufficient length.

Test point	Temperature difference
T1 (A, B, C)	40 K
T2A	50 K
T2B	40 K
T3	50 K

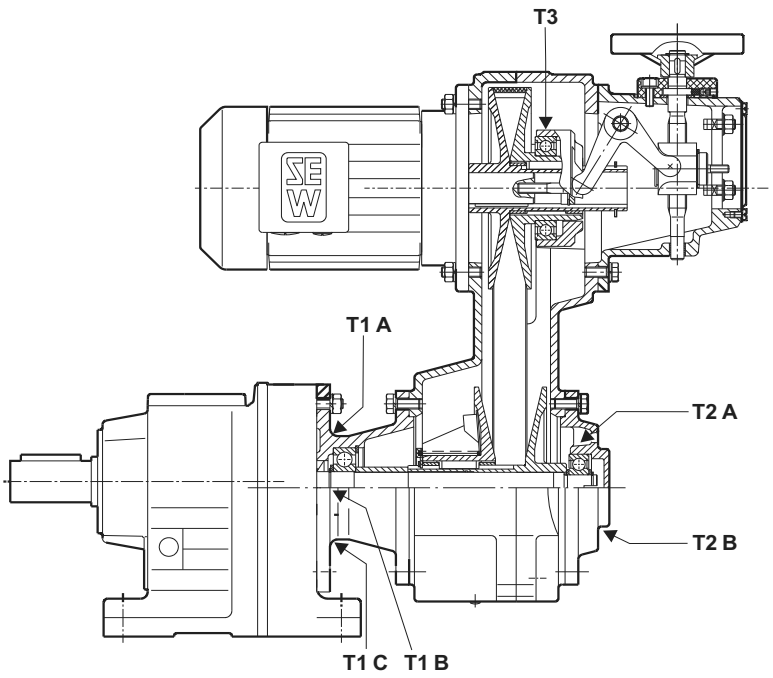

Fig. 16: Measuring the temperature of the anti-friction bearing

1. The bearing temperature of **bearing 1** can be measured **during operation** depending on mounting position and accessibility at one of the test points T1A, T1B or T1C.
2. The bearing temperature of **bearing 2** and **bearing 3** may **only** be measured **during standstill** at test points T2A and T3.

Measuring the anti-friction bearing temperature of bearing 2 (T2A, T2B):

If a design-specific protective cover is attached to bearing 2, it must first be removed.

1. With **ventilated** variable speed gear units, test point T2A is located about 15 to 20 mm behind the vent slot.
2. For **non-ventilated** variable speed gear units, test point T2A is not accessible. In this case, the temperature of the anti-friction bearing can be measured at test point T2B during operation.

Measuring the anti-friction bearing temperature of bearing 3 (T3):

1. Change the setting range until test point T3 is accessible.
2. Shut down the variable speed gear unit, and prevent it from re-starting unintentionally.
3. Remove the vent plate (see Fig. Changing wide V-belt, pos. 1).
4. Measure the temperature of the anti-friction bearing at test point T3.
5. Re-adjust the setting range.

Limiting the speed range for versions NV, H, HS

STOP

The limit speeds n_{min} and n_{max} are factory set and may not be changed.

If the maximum speed should drop by more than 10% due to wear of the wide V-belt, the wide V-belt must be replaced with an original SEW spare part.

6.7 Completing the inspection/maintenance process

- **Pay attention that you correctly reassemble the variable speed drive and carefully seal all apertures after maintenance and repair work with variable speed drives category 2D. In this case, explosion protection is particularly dependent on the IP enclosure.**
- **Ensure that the top ventilation openings of the bearing cover with the variable speed drives of categories 2G, 3G, and 3D are protected by a cowl in the area of the bearing cover to prevent objects from entering.**
- **If the mounting position requires that the control box be mounted horizontally, the vent plate located on the top must be covered by the cover plate that is included in the scope of delivery.**
- **For variable speed drives category 2D, all ventilation openings must be closed dust-tight.**
- **Perform safety and function checks.**

7 Operation and Service

- **Observe the safety notes in the individual sections.**
- **To eliminate malfunctions, the gear unit must be deactivated. Prevent the drive unit from unintentionally starting up (for example, by locking the keyswitch or removing the fuses from the power supply). Place an information sign by the on-switch to warn that the gear unit is being worked on.**

7.1 Customer service

If you require customer service assistance, please have the following information at hand:
- Nameplate information (complete)
- Nature and extent of the problem
- Time the circumstances of the problem
- Presumed cause

7.2 Malfunction of VARIBLOC® variable speed gear units

Problem	Possible cause	Solution
Drive slips or speed monitoring is triggered	Wide V-belt is worn	Replace wide V-belt (see Sec. "Inspection and Maintenance")
	Wide V-belt or face of adjustment disc is contaminated	• Replace wide V-belt with original SEW spare part (see Sec. "Inspection and Maintenance") • Clean adjustment disc with solvent or similar product
	Load is too high	Check power consumption and reduce to catalog values
Drive warms up excessively	Load is too high	See above
Drive is too loud	Wide V-belt is damaged Note: Damage can occur, for instance • After brief stalling of the drive • With impulse loading of the drive	1. Eliminate the cause 2. Replace wide V-belt with an original SEW spare part (see Sec. "Inspection and Maintenance")
Meshing/grinding noise	Bearing damage:	Change bearing (call customer service)

7.3 WEXA/WEX speed monitoring malfunctions

Problem	Possible cause	Solution
Voltage encoder is not functioning	Voltage encoder is not properly connected	Check voltage supply of voltage encoder using the evaluation electronics With correct voltage supply: • Consult manufacturer's documentation • Voltage encoder is not suitable for connection to the evaluation electronics (IGEX version) • Replace voltage encoder
LED on voltage encoder is not lit or is constantly lit	Switching interval is too long or too short	Adjust switching interval (see Sec. "Startup", change switching interval x)
No display	• Display unit is not properly connected • Voltage supply is missing or interrupted	• Connect display unit correctly according to wiring diagram • Check voltage supply according to wiring diagram
Incorrect display	Display unit is not properly adjusted	Check settings (see Sec. "Startup", setting data of digital remote speed indicator).

8 Declaration of Conformity

8.1 Variable speed gear units, categories 2G and 2D

SEW-EURODRIVE GmbH & Co
Ernst Blickle Str. 42
D-76646 Bruchsal

Konformitätserklärung

Declaration of Conformity

(im Sinne der Richtlinie 94/9/EG, Anhang VIII)

(according to EC Directive 94/9/EC, Appendix VIII)

SEW-EURODRIVE erklärt in alleiniger Verantwortung, dass die Verstellgetriebe der Kategorie 2G und 2D der Baureihe VARIBLOC® 01-41, und der Kategorie 2G der Baureihe VARIBLOC® 51auf die sich diese Erklärung bezieht, mit der

declares in sole responsibility that the variable speed gear drives in categories 2G and 2D of the VARIBLOC® 01-41 series, and in category 2G of the VARIBLOC® 51 series that are subject to this declaration are meeting the requirements set forth in

Richtlinie 94/9/EG

Directive 94/9/EG

übereinstimmen.

Angewandte Norm:	**EN1127-1**
Applicable standard:	***EN1127-1***

SEW-EURODRIVE hinterlegt folgende technische Dokumentation zur Einsicht bei benannter Stelle:

FSA GmbH, EU-Kennnummer 0588

***SEW-EURODRIVE** will archive the following technical documentation for reference purposes at the following location:*

FSA GmbH, EU Code 0588

SEW-EURODRIVE GmbH & Co

Bruchsal, den 09.08.2000

Ort und Datum der Ausstellung

Place and date of issue

ppa

Funktion: Vertriebsleitung / Deutschland

Function: Head of Sales / Germany

8.2 Variable speed gear units, categories 3G and 3D

TÜV CERT DIN EN ISO 9001 SEW EURODRIVE

Konformitätserklärung

Declaration of Conformity

(im Sinne der Richtlinie 94/9/EG, Anhang VIII)

(according to EC Directive 94/9/EC, Appendix VIII)

SEW-EURODRIVE GmbH & Co
Ernst Blickle Str. 42
D-76646 Bruchsal

SEW-EURODRIVE erklärt in alleiniger Verantwortung, dass die Verstellgetriebe der Kategorie 3G und 3D der Baureihe VARIBLOC® 01-51, auf die sich diese Erklärung bezieht, mit der

declares in sole responsibility that the variable speed gear drives in categories 3G and 3D of the VARIBLOC® 01-51 series that are subject to this declaration are meeting the requirements set forth in

Richtlinie 94/9/EG

Directive 94/9/EG

übereinstimmen.

Angewandte Norm:	**EN1127-1**
Applicable standard:	***EN1127-1***

SEW-EURODRIVE hält die gemäß 94/9/EG geforderten Unterlagen zur Einsicht bereit.

***SEW-EURODRIVE** will make available the documents required according to 94/9/EG for reference purposes.*

SEW-EURODRIVE GmbH & Co

Bruchsal, den 09.08.2000
Ort und Datum der Ausstellung
Place and date of issue

ppa
Funktion: Vertriebsleitung / Deutschland
Function: Head of Sales / Germany

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	Additional addresses for service in Germany provided on request!		

France			
Production **Sales** **Service**	**Haguenau**	SEW-USOCOME 48-54, route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Assembly **Sales** **Service**	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Paris	SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
	Additional addresses for service in France provided on request!		

Algeria			
Sales	**Alger**	Réducom 16, rue des Frères Zaghnoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84

Argentina			
Assembly **Sales** **Service**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
	Townsville	SEW-EURODRIVE PTY. LTD. 12 Leyland Street Garbutt, QLD 4814	Tel. +61 7 4779 4333 Fax +61 7 4779 5333 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://sew-eurodrive.at sew@sew-eurodrive.at

Belgium			
Assembly **Sales** **Service**	**Brüssel**	SEW Caron-Vector S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
	Additional addresses for service in Brazil provided on request!		

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@fastbg.net

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 4322-99 Fax +237 4277-03

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.reynolds@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta. B.C. V4G 1 E2	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Street LaSalle, Quebec H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago de Chile**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 www.sew-eurodrive.cl ventas@sew-eurodrive.cl

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25322611 gm-tianjin@sew-eurodrive.cn http://www.sew-eurodrive.com.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021 P. R. China	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew.com.cn
	Additional addresses for service in China provided on request!		

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@net.hr

Czech Republic			
Sales	**Praha**	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Luzna 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 220121234 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Mustamäe tee 24 EE-10620Tallin	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	Electro-Services B.P. 1889 Libreville	Tel. +241 7340-11 Fax +241 7340-12

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk

Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 2 7960477 + 79604654 Fax +852 2 7959129 sew@sewhk.com

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu

India			
Assembly **Sales** **Service**	**Baroda**	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi • Baroda - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 http://www.seweurodriveindia.com mdoffice@seweurodriveindia.com
Technical Offices	**Bangalore**	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 salesbang@seweurodriveinindia.com

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 lirazhandasa@barak-online.net

Italy			
Assembly **Sales** **Service**	**Milano**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36

Japan			
Assembly **Sales** **Service**	**Iwata**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 sewjapan@sew-eurodrive.co.jp

Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master@sew-korea.co.kr

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 7139253 Fax +371 7139386 http://www.alas-kuul.com info@alas-kuul.com

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com

Lithuania			
Sales	**Alytus**	UAB Irseva Naujoji 19 LT-62175 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Malaysia			
Assembly **Sales** **Service**	**Johore**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my

Mexico			
Assembly **Sales** **Service**	**Queretaro**	SEW-EURODRIVE MEXIKO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrail Queretaro C.P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	Afit 5, rue Emir Abdelkader MA 20300 Casablanca	Tel. +212 22618372 Fax +212 22618351 richard.miekisiak@premium.net.ma

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 241-020 Fax +47 69 241-040 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Lodz	Tel. +48 42 67710-90 Fax +48 42 67710-99 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucuresti**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 849 47-70 Fax +221 849 47-71 senemeca@sentoo.sn

Serbia and Montenegro			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 dipar@yubc.net

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybnicna 40 SK-83107 Bratislava	Tel. +421 2 49595201 Fax +421 2 49595200 http://www.sew.sk sew@sew-eurodrive.sk
	Zilina	SEW-Eurodrive SK s.r.o. ul. Vojtecha Spanyola 33 SK-010 01 Zilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-97411 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za dross@sew.co.za
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch

Thailand			
Assembly **Sales** **Service**	**Chon Buri**	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

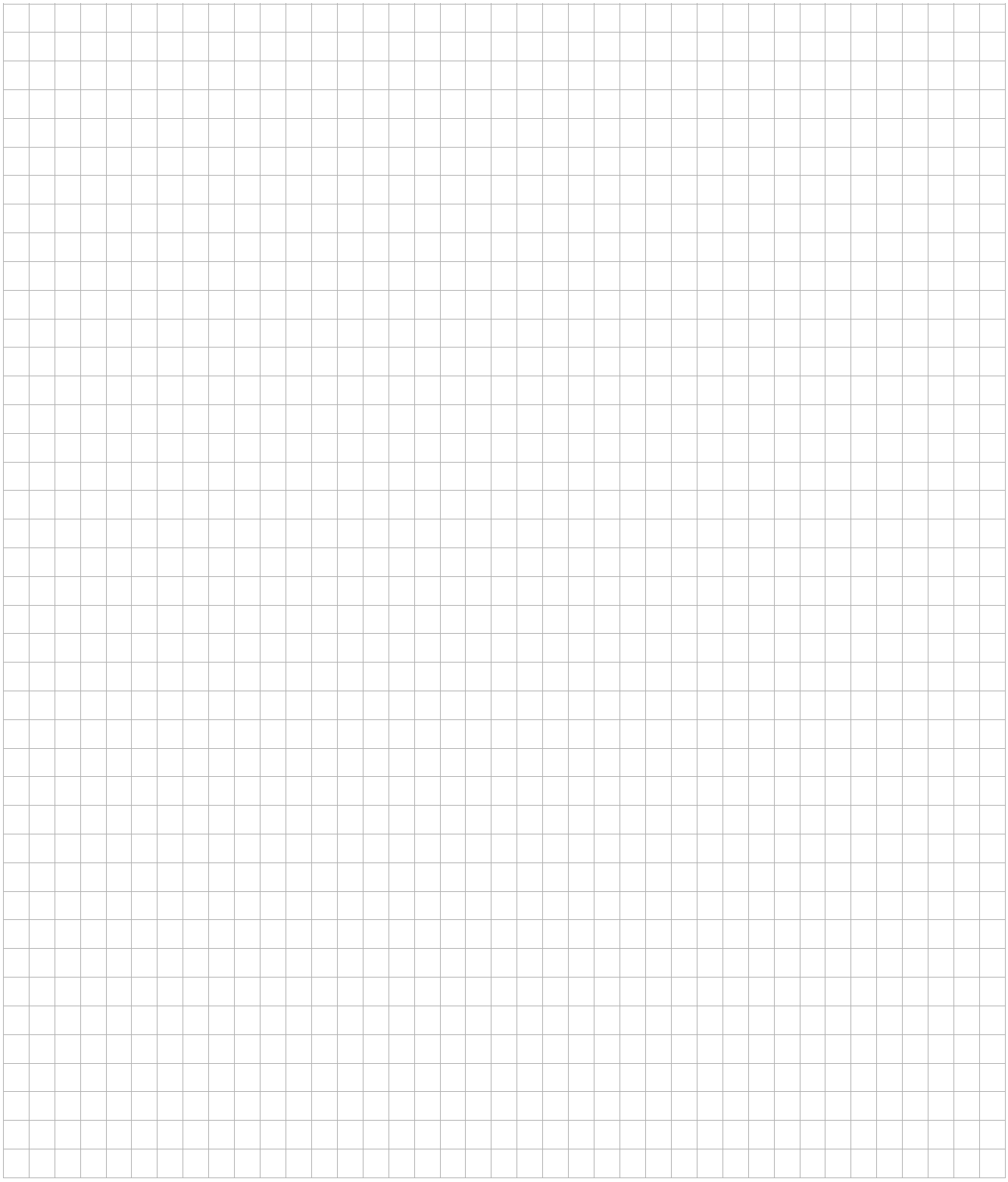
Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service 7, rue Ibn El Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76 tms@tms.com.tn

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 164 3838014/15 Fax +90 216 3055867 sew@sew-eurodrive.com.tr

Ukraine			
Sales **Service**	**Dnepropetrovsk**	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

USA			
Production **Assembly** **Sales** **Service**	**Greenville**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**San Francisco**	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve sewventas@cantv.net sewfinanzas@cantv.net



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